DOCUMENT RESUME

ED 039 081 24 RC 004 344

AUTHOR Levensky, Kay
TITLE The Performance of American Indian Children on the Draw-A-Man Test. National Study of American Indian Education, Series III, No. 2, Final Report.
INSTITUTION Chicago Univ., Ill.
SPONS AGENCY Office of Education (DHEW), Washington, D.C. Bureau of Research.
BUREAU NO BR-8-0147
PUB DATE Mar 70
CONTRACT OEC-0-8-080147-2805
NOTE 22p.

EDRS PRICE EDRS Price MF-$0.25 HC-$1.20
DESCRIPTORS Age Differences, *American Indians, *Anglo Americans, *Cross Cultural Studies, Cultural Factors, *Elementary School Students, Freehand Drawing, *Intelligence Tests, Sex Differences, Student Evaluation, Tribes
IDENTIFIERS *Goodenough Draw A Man Test

ABSTRACT

As a part of the National Study of American Indian Education, this document reports on 1700 American Indian primary school children (representing 14 tribal groups and 12 states) who were administered the Goodenough Draw-A-Man Test (DAM) as a measure of mental alertness. A comparison is given of the Indian and white children's scores. It appears that, among Indian children aged 6 to 8.5 years, intelligence quotient as measured by the DAM is definitely above the average for white children of comparable age in the United States. For children aged 8.5 to 13, the Indian children average slightly below white children. It is concluded that if the DAM IQ is taken as a measure of mental alertness, the American Indian children score as well as or better than white American children. The document is appended with a bibliography and tables showing pertinent data. (AN)

ED039081

The National Study of American Indian Education

OE/BR 8-0147

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

USOE
No. OEC-0-8-080147-2805

RECEIVED
JUN 1 1970
NMSU
E.R.I.C.

Final Report

THE PERFORMANCE OF AMERICAN INDIAN CHILDREN ON THE DRAW-A-MAN TEST

Series III

No. 2

By Kay Levensky
March, 1970
Committee on Human Development
The University of Chicago

RE 004344

NATIONAL STUDY OF AMERICAN INDIAN EDUCATION

The attached paper is one of a number which make up the Final Report of the National Study of American Indian Education.

This Study was conducted in 1968-69-70 with the aid of a grant from the United States Office of Education, OEC-0-8-080147-2805.

The Final Report consists of five Series of Papers:

I. Community Backgrounds of Education in the Communities Which Have Been Studied.

II. The Education of Indians in Urban Centers.

III. Assorted Papers on Indian Education--mainly technical papers of a research nature.

IV. The Education of American Indians--Substantive Papers.

V. A Survey of the Education of American Indians.

The Final Report Series will be available from the ERIC Document Reproduction Service after they have been announced in Research in Education. They will become available commencing in August, 1970, and the Series will be completed by the end of 1970.

THE PERFORMANCE OF AMERICAN INDIAN CHILDREN ON THE DRAW-A-MAN TEST

Kay Levensky

As part of the National Study of American Indian Education,* over 1700 American Indian primary school children, representing 14 tribal groups and 12 States, were administered the Goodenough Draw-A-Man Test (DAM).(6) The project offered an excellent opportunity to add to the DAM literature on cross-cultural comparison, as it involved: (1) groups never before tested and/or living in previously unrepresented areas, e.g., Chippewa living in Minneapolis and St. Paul; and (2) groups previously tested which could be compared with earlier data.

Since it was first described in 1926,(6) the DAM has been used widely as a test of intelligence in comparative studies of children from various cultural subgroups. It is easily administered, requiring only a piece of paper and a pencil, and instructions to "draw a man, the best man that you can." The test is scored by counting the number and accuracy of details in the figure drawn, without reference to esthetic merits except that representation of correct proportions and evidence of good motor coordination earn more points. The test might be described operationally as one of accuracy of perception, since the child is scored for the accuracy with which he represents a man; or as a measure of "mental alertness," of attention given to one's social environment.

Goodenough originally introduced the DAM as a "culture-free" measure of general intelligence because no language skills were required as is the case for traditional intelligence tests. However, as early as 1946, Havighurst (9) concluded that "the evidence points strongly to the conclusion that environment affects the performance of children on the Draw-A-Man test." This evidence, together with that provided by Dennis in an earlier study (3), indicated that the remarkably high scores obtained by Hopi boys could be related to the emphasis Hopi culture traditionally places on male art skills.

Evidence of cultural influences on children's DAM scores, both positive and negative, has been so overwhelming that Goodenough has since withdrawn her claim: (7)

> Considering all the evidence thus far described, it is clear that cultural differences do appear to a greater or less extent in the drawings of children. The present writers would like to express the opinion that the search for a culture-free test. . . is illusory and that the

---

* This study was sponsored by the U.S. Office of Education Bureau of Research, Contract #OEC-0-8-080147-2805.

> naive assumption that mere freedom from verbal requirements renders a test equally suitable for all groups is no longer tenable. (p.399)

More recently, Dennis (2,4) has attempted to determine the specific cultural factors which influence children's DAM performance. On the basis of a valuable compilation of cross-cultural data (2), Dennis concludes that a group's mean DAM score is an excellent indicator of (1) degree of modernization, i.e., acculturation to Western Civilization, and/or (2) the amount of experience it has had with representational art, and of encouragement to engage in it.

In the present study, the DAM was administered as a general measure of mental alertness. In view of the generally low average scores of Indian children on school achievement tests, it was desirable to use a test which did not require the ability to read. As a by-product of the study, some consideration is given to the effects of culture on performance. Differences in average scores are taken as indicators of cultural differences, though the cultural characteristics to which they are related are not clearly known.

PROCEDURE

Field Center	Geographical Area Covered
North Carolina State University	North Carolina, Baltimore
Oklahoma State University	Oklahoma
San Francisco State University	California, Washington, Alaska
University of Arizona	Arizona, New Mexico
University of Chicago	Chicago
University of Colorado	Montana, South Dakota, Arizona
University of Minnesota	Minnesota, Wisconsin

Each center selected the particular groups in its area to be studied. Care was taken to include a variety of Indian cultures, urban, rural and reservation locations, and economic bases in the total population of the study.

Sampling and Test Administration

The DAM was administered to Indian school children in grades 1 and 5 from B.I.A., public, and private (parochial) day and boarding schools. Where the total number of Indian children enrolled in a school was small, grades 2 through 4 and 6 were included in the sample. A child was considered to be Indian if he met one of the following criteria: a) he had one-fourth or more Indian ancestry; b) one or both of his parents were on the Indian tribal rolls; 3) he identified himself as Indian; and/or d) his teacher or friends identified him as Indian. Since each child's drawing was accompanied by a background information sheet, questionable cases could be dropped from the sample.

The tests were administered according to Goodenough's original instructions (6). In largely Indian schools, whole classrooms were tested at once. Where the numbers per class were small, children were taken from class and tested as a group. In most cases, the test administrators were the classroom teachers or research assistants from the project. Occasionally, the school principal gave the test.

Scoring the Tests

All of the DAM protocols were sent to the Chicago field center for scoring. When submitted, each picture was identified by the child's name or code number, test date, sex, grade, and birthdate. In many cases, the birthdate was difficult to obtain. When it was not available in school records, the teacher's or child's estimate was used. Where only month and year of birth were known, the day was set as the 15th. If the accuracy of the birthdate was questionable, the picture was dropped from the sample.

The pictures were strictly scored according to the original Goodenough criteria.(6) Although the entire set of pictures was scored by one or another of two persons, inter-rater reliability was established among three scorers. A set of 20 pictures covering several ages and groups was selected and scored independently. Ratings were compared point by point and a consensus reached through discussion. A second set of 20 pictures was then selected and the raters scored them, again, independently. The final raw score correlations among the three raters were: 0.96, 0.97, and 0.98.*

Each center conducted its testing independently, but according to the instructions given in the field manuals. Massive retesting was necessary in only two instances. First grade Blackfeet children from one school earned such high scores that coaching by their teachers was suspected. (Unfortunately there was no sample of older children from this group for comparisons.) In the retesting done 7 months later, the extreme scores while still high, had dropped into a more normal range, although the group means were not affected.#

---

* The three raters were: Robert J. Havighurst, Camille Numrich, and the author. The main job of scoring was done by the author and Camille Numrich.

Upon investigation it was learned that several first grade teachers had, at the very least, suggested articles of clothing to the children during testing. In the retest, some scores dropped as much as 20 points, while others were raised a few points. The validity of the retest is confounded by the fact that the retest used for this study constituted the second testing of the day. Since teachers had again coached the children, another retest was called, this time to be administered by research assistants. The Table below presents the mean IQ scores earned by the same group of children on the first and third testing (7 months later).

		First (Coached) Testing		Third Testing	
Sub.	N	$\overline{IQ}$	Range	$\overline{IQ}$	Range
Boys	30	107	74-168	105	78-146
Girls	30	116	86-177	119	88-155
Group	60	112	74-177	112	78-155

Comparison of Average IQ scores earned on the DAM in the First and Third Testing of Blackfeet Children

A second massive retesting was administered to the older Quinault children, Taholah, Washington. The group mean was low, 89.0, and many of the pictures submitted were cartoon-like, seeming to indicate that the children did not take the test very seriously. The school principal retested the same group using Harris-Goodenough test booklets, but as with the Blackfeet children, the group mean remained nearly the same.

Individual retests were occasionally administered when the total sample representing a tribal group was so small that it was not desirable to drop pictures which did not conform, even minimally to test instructions. For example, of a total of 15 girls from one group, three drew snowmen and so were retested. In only one group were there pictures of women (Pawnee).* Because of the small size of the sample, adjustments were made in scoring to accommodate them.

---

*These three subjects were good friends. Only two were available for retesting, and both were described as having unsatisfactory home lives, with especially poor relationships with their fathers. When taken from class together for retesting, both refused at first to draw men, stating that they hated them. Only when allowed to draw women first would they comply. This event lends support to Harris's thesis(8) that an "intelligence" score should be taken from three drawings: a man, a women, and oneself.

Another "psychological" factor was revealed through retesting children who drew deviant pictures. Stick figures turned up in nearly every group and were scored as if they truly represented a child's ability. At best, a child will receive 9 or 10 points for such a figure. If, for example, he is 6 years-0 months at testing, this score gives him an IQ of 88. One subject whom it was convenient to retest drew a true man the second time which earned him an IQ score of 130.

Copying was frequent--undoubtedly encouraged by testing an entire classroom at one time. This usually did not interfere with test validity as it generally consisted of repeated themes or clothing decorations. Genitals, male and female, occurred in pictures from three areas (Menominee, Lumbee, Blackfeet). In these cases the authors are inclined to believe that a disturbed child (genitals occurred only in boys' drawings) began it and others picked it up. That is, there was no evidence of cultural influence. Where one child actually drew a picture for another* (approximately ten instances) the picture was dropped.

---

* This could be detected when nearly identical pictures appeared under different names, or where false starts were considerably less sophisticated than the finished picture. It occurred both with children in the same class and with an older child doing it for his younger sibling.

RESULTS

Draw-A-Man tests for 1,678 Indian children--842 girls and 836 boys--were scored, and the associated IQ scores were computed. The children in each Indian group were divided up by sex and age. With regard to age, the subjects were divided as follows:

Age Level I--6 years, 0 months (72 months) to 8 years, 6 months (102 months);
Age Level II--8 years, 7 months (103 months) and up.

In computing IQ's for children in Level II, a chronological age of 12 years, 6 months was taken as the upper limit. Thus, children whose chronological age was greater than 12-6 (57 cases out of 811) received an IQ based on an age of 12-6. It was assumed here that performance on this test would not change after this point--that is, it was assumed that there is a ceiling effect inherent in the test which places older children at a disadvantage.* (1) The Goodenough scoring directions take 13-6 as the maximum chronological age for computing IQ. Thus the IQs for pupils over 12-6 in this study are larger than they would be if the standard Goodenough procedure had been used.

---

* One study showed that mentally retarded children showed a mental age growth until age 16 on the DAM.(12) This means that mentally retarded children in our sample who were over 12-6 would have been advantaged by our limit.

The data obtained in this study are presented in the following tables. Average chronological age is reported in months; true, uncorrected chronological ages were used when computing the average age of children in Level II. The one-tailed t-test of statistical significance ($t_{.05}$) was utilized

in the analysis. According to this test, two groups, each totalling 30 members, are significantly different at the .05 level if they differ by 13 or more IQ points. Groups totaling 50 must differ by 8.2 IQ points or more, and groups of 70, by 7.0 points, for this difference to be significant.

Table 1 presents the basic findings for Indian children as a whole:

1. Indian children as a group perform well within the normal range in the DAM. Mean IQ is 101.5.
2. Younger children (Level I) earned a significantly higher average IQ than older children (Level II), 105.2 and 97.5, respectively.
3. Younger girls generally do better than younger boys, but this difference is lost among the older children.
4. Younger girls do significantly better than older girls--107.5 and 97.6, respectively.

Table 2 presents a breakdown of the data by sex, age, and tribal group. Samples having a total N of less than 22 for one age level were not included.

The rest of the tables present comparisons among tribal groups, showing highest and lowest average IQ earned, statistically significant differences by age level and sex, and finally according to geographical area.

DISCUSSION

Table 3 (parts A, B, C, D) presents the Indian groups which earned the highest average IQ scores, by sex and age. Some groups earned high scores in nearly all categories:

Hopi--Boys I, Boys II, Girls I, and Younger children
Eskimo--Boys I, Boys II, Girls II
Apache--Girls I, Girls II, Boys II
Chicago--Girls I, Girls II, Boys II

Unfortunately, there were no older children in the Blackfeet and Sioux samples so that comparison with the groups named above is not possible.

According to Dennis (2,4) the high scores achieved by these four groups (and the others in this Table) could be a function of (a) cultural emphasis on representational art, or (b) high degree of acculturation. The Hopi and Eskimo are the most culturally isolated of the groups studied in this project, but they both have long been noted for their artistic traditions. Hopi boys have obtained superior scores on the DAM test in earlier studies, e.g., 125 in the study by Havighurst.(9) Dale Harris devotes quite a long section in his book Children's Drawings as Measures of Intellectual Maturity (8) on the unusually high quality of pictures

drawn by older Eskimo children. The present study confirms these findings. In both Hopi and Eskimo groups, the pictures submitted showed greater awareness of a cultural distinctiveness and greater attention to detail than did any other group (a possible exception might be come of the groups making up the Menominee sample).

Age Differences

In addition to the problem of differential performance, Table 3 part E raises another issue. Younger children consistently scored higher than the older children of their group. The general ranges of mean IQ for each age level are as follows:

Age Level I--95-116
Age Level II--88-107.

Tables 4 and 5 provide further data concerning the drop in IQ with age. Table 4 indicates that (a) the greatest drops with age occur among girls, and (b) of the six groups (Apache, Hopi, Chippewa, Papago, Chicago, Menominee) which show statistically significant differences between the average IQ scores of younger and older girls, only one (Chippewa) also shows a significant difference between the average IQ scores of younger and older boys.

Several studies have reported that the IQ scores earned on the DAM drop with age. Since an IQ is based on a set of norms for a "standard or normal group," (in this case, the group of American children on which the test was originally standardized by Goodenough), the statement that IQ decreases with age means that the group under study show lower scores than the standard American group as they grow older (from age 8 or 9 to age 12 or 13).

The reader will note that this study has used the norms originally published by Goodenough, rather than the more recent norms on the revised scale of Dale B. Harris.(8) Harris refined the scoring, adding a number of points to the scale, and he also published one scale for boys and one for girls which reflected the fact that girls score higher than boys at all ages. This study used the original Goodenough scoring scale and norms, because this would facilitate comparison with earlier DAM studies. It may be that some of the age differences in our data would disappear if the revised norms and scoring procedure were used.

However, even if this proposition is granted, there appear to be greater drops with age among some groups than among others, and this difference would persist even with new norms. Therefore we will discuss this phenomenon.

Dennis(4) noted great decreases in age with Near Eastern children and attributed these to cultural factors which operate more strongly after age 6 than before this age. Pringle(15 attributed the decrease among British children to "unmistakable signs of dislike" which children aged 9 and 10 showed toward the task. Presumably they would not work as carefully on the task as would children who enjoyed the task. Bowman(1) attributed the decline among children aged 11 and 12 to a "ceiling effect" inherent in the test due to the fact that the highest possible scores can be obtained more easily by older than by younger children, thus setting an arbitrary limit on the IQ at the high end of the distribution for older children.

Khatena(11) claims that schooling smooths out cultural differences which

are shown by younger children with little or no school experience. This might explain why some Indian groups such as the Hopi boys decline in average score with age. The cultural advantage of the younger Hopi boys tends to be lost in comparison with other Indian groups who do not have a cultural encouragement toward drawing, but who get experience in drawing as they move up through the school.

The possibility of a "ceiling effect" was tested in our Indian data. If a raw score of 40 points is taken as a relatively high score for anybody (45 points was the highest raw score we actually recorded) the comparable IQs for children of the average ages of our two age levels are:

	Average Age	Raw Score	IQ
Level I	7-3	40	179
Level II	11-2	40	116

Thus, the distribution of IQ scores for an older group is likely to be limited at the upper end by the raw score ceiling on the test, while low scores are not so limited. Harris (8,p.103) says that a ceiling effect becomes evident for students by age 13.

A frequency distribution was made for the IQ scores of our older group, with scores extending from 50 to 146. The median was 97, almost identical with the mean of 97.5. But a marked ceiling effect should push the median well above the mean.

A second test for ceiling effect was undertaken by determining the average IQ actually earned by children aged 12 years and above in our study. There were 156 such cases, with an average age of 12.5, and an average IQ of 92.1. This is to be compared with the average of 97.5 for the 811 children aged 8.6 and above. This is compatible with the hypothesis of a ceiling effect or with a more general hypothesis of some form of school or cultural disadvantage affecting Indian children as they grow older than 9 or 10.

There is also the fact that the scores of American Indian girls decrease more with age than the scores of Indian boys. Two studies, from India(14) and Guatemala(10) explain a relatively poor showing of girls in terms of cultural-educational influences. The sex differences seen in this study are worth further study.

School Achievement and the DAM

Information concerning the school performance of the older children (grades 4 and up) was obtained from their classroom teachers. The teachers were asked to rank those children in the top, middle, or bottom thirds of their class in terms of school performance. Thus the children were to be compared with their own school-mates, rather than with some wider group. In a few cases, standard achievement test data were recorded for the children, and this may have influenced the ranking. However, most children were simply compared by their teachers with other children in the same school grade.

A chi-square comparison was made between the DAM IQ and the class rank of the student in the case of six of the school groups, all at age level II. Three of these groups showed no statistically reliable relationship between DAM and class rank. They were: Eskimo, Hopi, and Chicago. Two groups did show a

relationship significant at the .05 level. They were: Quinault-Makah (combined) and Menominee. Thus there is at the most only a small positive correlation between DAM IQ and the school performance of the students as judged by classroom teachers.

Qualitative Differences in Pictures

The present author agrees with Harris(8) that a search for "ideopathic" signs is a fruitless one. At best, various groups were notable for the following reasons:

Eskimo. As noted elsewhere, the Eskimo drawings were well developed and showed an awareness of cultural distinctiveness. The figures were dressed in parkas and boots which made them appear to have shortened legs and large feet. The pictures were also distinguished by a consistency of nose representation.

Hopi. This was the only group occasionally to depict a distinctively Indian hair style, and to consistently represent nose, nostrils and ears. It was the only group consistently to use ω as a nose representation.

Lumbee (Magnolia). Unusual for the large number of very small figures drawn in the younger group (3 inches high or less). There were also a number of pictures drawn for one child by another.

Lumbee (Pembroke). Well developed cowboy, or space-man themes.

Menominee. Indian costumes occurred more frequently in this group than in any other.

As a whole, the pictures were in accord with recent surveys of children's human figure drawings.(8) That is, figures were static without much attempt at scenery or background detail, and clothing was simple. Ties and hats appeared frequently in pictures of younger children as the only clothing details; pants and buttonless, collarless shirts were more common with older children. Cowboy themes were in low proportion, but where one picture occurred in a sample, there were usually several more. Often, however, cowboys were distinguishable only by their hats and guns.

The simplified clothing for all groups could have had a general depressing effect on IQ scores. Another source of lowered scores lies in the very frequent absence, at all ages, of hands and/or hand details, ears, and accurate representation of body proportions.

Comparisons with Scores of Non-Indian Children

Unfortunately there is very little data on non-Indian children with which to compare the above results. In the course of this study the drawings of 100 younger and 28 older non-Indian children were scored. Since this group is so small a summary of the comparisons made between it and the Indian children will be brief.

1. There were no significant differences between boys and girls at either age level. (GI - BI = 5.5; GII - BII = 2.6)

2. There were no significant differences between younger and older children for either sex.

3. Older non-Indian children scored significantly higher than older Indian children. Only Hopi BII scored comparably to the non-Indian sample: 107.1 and 105.3, respectively. The Chicago group of GII came closest to the non-Indian GII sample: 102 and 108, respectively.

4. The older non-Indian girls did better than the younger girls by an insignificant 1.6 points.

It is unfortunate that the non-Indian sample is so small. It provides contrasts with the Indian sample. For example, non-Indian girls do not change in IQ score with age.

Another problem a comparable older white sample might have solved is the age factor. Non-Indian children in the younger sample averaged 6 months younger than Indian children, but the average IQs earned by both were the same:

Indian I (87 mos.)--105	Indian II (134 mos.)--98
Non-Indian I (81 mos.)--106	Non-Indian II (133)--107

On the other hand, older children in the two samples were of the same age but non-Indian children earned an average IQ of 9.2 points higher. However, given the great imbalance in sample size, this difference is not significant.

Comparison with Earlier Alaskan Studies*

An extensive testing program carried out by W. C. Eells in Alaska in 1930-31 produced a quantity of DAM data which can be compared with the 1969 tests, more than a generation later, on the same populations.(18) Eells secured drawings from primary school children in Bethel and Angoon, among other Alaskan communities. Eells' results are compared with the contemporary results in Table 6.

The striking thing about these data is the higher DAM IQ earned by the Eskimo children in 1969 than a generation earlier--103 vs. 94 for the age group under 13 years of age. Eells claimed that his Eskimo sample was more representative than the Indian sample, since the latter children were mainly in boarding schools. The Eskimo sub-group from Bethel tested by Eells had a mean DAM IQ of 95.1 for 60 pupils.

It should be noted here that the downward trend with age of the Eells' data on Eskimos is probably partly caused by the inclusion of children over 13 years of age in the testing. There is a "ceiling effect" of the tests for such children. The Goodenough directions provided that all children over 13.5 in age should be arbitrarily given a chronological age of 13.5 in computing IQ, but since the maximum raw score possible on the DAM is only slightly more than the average score for children aged 13.5, such children cannot possibly earn a high IQ. However, the downward age trend extending from age 8 to 12 is not much affected by a "ceiling effect."

Conclusion

It appears that, among a large and varied group of American Indian children, the Draw-A-Man IQ is definitely above the average for white children in the United States for children aged 6 to 8.5. For children aged 8.5 to 13, the Indian children average slightly below the average for white children.

There is a considerable range of average IQ among the 21 different Indian groups who were studied. The mean IQs ranged from 93 to 113 for the group under 8.5 years of age, and 89 to 101 for the group over 8.5 years of age.

If the DAM IQ is taken as a measure of mental alertness, the American Indian children are as good as or better than white American children.

---

* This section was written by Robert J. Havighurst

R E F E R E N C E S

1. Bowman, P. H., et al, "Studying Children and Training Counselors in a Community Program," Supplementary Educational Monographs, Univ. of Chicago Press, (1953) No. 78, p.17.

2. Dennis, W., "Goodenough Scores, Art Experience, and Modernization," J. Soc. Psych. (1966) 68, 211-228

3. Dennis, W., "The Performance of Hopi Children on the Goodenough Draw-A-Man Test," J. Comp. Psych. (1942) 34, 341-348.

4. Dennis, W., "Performance of Near Eastern Children on the Draw-A-Man Test," Child Dev. (1957) 28 (4), 427-430.

5. Garrett, Henry E., Statistics in Psychology and Education, 5th ed., New York, Longmans, Green & Co., 1961.

6. Goodenough, F. L., Measurement of Intelligence by Drawings. New York: World Book Co., 1926.

7. Goodenough, F. L., and Harris, D. B., "Studies in the Psychology of Children's Drawings," Psych. Bull. (1950) 47 (5), 369-433.

8. Harris, Dale B., Children's Drawings as Measures of Intellectual Maturity, New York: Harcourt, 1963.

9. Havighurst, R. J., et al, "Environment and the Draw-A-Man Test: The Performance of Indian Children," J. of Abn. and Soc. Psych. (1946) 41 (1), pp.50-63.

10. Johnson, Dale L. Johnson, Carmen A., and Price-Williams, D., "The DAMT and Raven Progressive Matrices Performance of Guatemalan Boys and Ladino Children, Revista Interamericana de Psicologia, (1967) 1 (2) 143-157.

11. Khatena, Joe and Gowan, J.C., "Cross Cultural Measurement of Intelligence with the DAM and CPM," Gifted Child Quart. (1967) 11 (4), 227-30.

12. Mitchell, Anna C., "A New Maximum Chronological Age for the Draw-A-Man Test," J. Consult. Psych. (1959) 23, 555-557.

13. Owens, C. S., and Bass, Willard P., "The American Indian High School Dropout in the Southwest," Southwestern Cooperative Educational Laboratory, Inc., Albuquerque, N.M., January 1969.

14. Phatak, P. "Sex Differences of Phatak's D-A-M Scale," Educ. Psych. Rev. Baroda, (1962) 2 (1), 24-29.

References (continued)

15. Pringle, M. L., Kellmer, and Pickup, K. T., "The Reliability and Validity of the Goodenough Draw-A-Man Test: A Pilot Longitudinal Study," Brit. J. of Ed. Psych., (1963) 33 (3), pp.297-306.

16. Selinger, A. D., "The American Indian High School Dropout: The Magnitude of the Problem," Northwest Regional Educational Laboratory, Portland, Oregon, September 1968.

17. Sundberg, Norman, and Ballinger, Thomas, "Nepalese Children's Cognitive Development as Revealed by Drawings of Man, Woman, and Self," Child Development, (1968) 39, 969-985.

18. Anderson, H. Dewey and Eells, Walter Crosby. Alaskan Natives: A Survey of Their Sociological and Educational Status. Stanford, Calif.: Stanford University Press, 1935.

Table 1

AVERAGE AGES AND IQs EARNED BY INDIAN CHILDREN

ON THE DRAW-A-MAN TEST

	Boys			Girls			Group		
	Average Age*	N	IQ	Average Age*	N	IQ	Average Age*	N.	IQ
I#	87	441	103.0	86	426	107.5	87	867	105.2
II#	135	395	97.5	132	416	97.6	134	811	97.5
		836	100.4		842	102.6		1678	101.5

* Ages computed in months

\# I, II--Age group designations:
I = 6 yrs. 0 mos. to 8 yrs. 6 mos;
II = 8 yrs. 7 mos. up (see text).

The National Study of American Indian Education

Table 2

AVERAGE IQ SCORES EARNED BY INDIAN CHILDREN
ON THE DRAW-A-MAN TEST

Indian Group	Age Level	Avg. Age	Boys N	Boys IQ	Girls N	Girls IQ	Group N	Group IQ	Group S.D.
Apache (Ariz.)									
Fort Thomas	I	78	19	97.3	18	111.9	37	104.4	13.6
	II	149	23	98.7	24	93.8	47	96.2	10.3
Cibecue	I	91	16	101.8	21	103.6	37	102.9	20.2
	II	126	34	97.4	35	98.5	69	97.9	13.9
Blackfeet (Browning, Mont.)	I	86	46	107.8	48	115.6	86	111.8	16.2
Chippewa (Minneapolis & St.Paul	I	90	19	104.1	21	115.1	40	109.9	20.4
	II	119	39	89.4	33	100.0	72	94.3	18.5
Chippewa (Menominee County, Wisconsin)	I	91	59	99.5	55	108.0	114	103.6	17.7
	II	125	80	95.6	75	99.8	155	97.6	15.1
Eskimo (Bethel, Alaska)	I	90	30	108.5	29	103.9	59	106.2	12.4
	II	134	31	97.6	31	101.5	62	99.6	12.1
Hoopa (California)	I	77	15	97.5	13	99.5	28	98.4	13.7
Lumbee (N. Carolina) Magnolia	I	84	25	92.4	25	101.5	50	97.0	12.9
	II	132	25	91.9	25	95.0	50	93.5	15.2
Pembroke	I	85	13	101.6	14	95.4	27	98.4	20.1
	II	132	25	87.9	25	90.7	50	89.3	12.6
Makah (Neah Bay, (Washington)	I	85	9	93.2	13	93.4	22	93.3	12.3
Navaho (Shonto)	I	90	30	110.2	30	107.8	60	109.0	14.7
Papago (Indian Oasis)	I	84	15	104.4	13	105.4	28	104.8	13.6
	II	138	11	99.2	21	91.3	32	94.0	14.3
Pima	II	135	29	94.9	30	90.1	59	92.5	13.1

Table 2 (continued)

AVERAGE IQ SCORES EARNED BY INDIAN CHILDREN
ON THE DRAW-A-MAN TEST

Indian Group	Age Level	Avg. Age	Boys N	Boys IQ	Girls N	Girls IQ	Group N	Group IQ	Group S.D.
Pueblo (Hopi)	I	87	25	114.0	30	110.4	55	112.0	13.8
	II	142	14	107.1	17	93.0	31	99.4	14.0
Quinault (Taholah, Wash.)	II	130	13	91.8	15	88.4	28	90.0	23.9
Sioux-Cheyenne (South Dakota)									
Cheyenne-Eagle Butte	I	82	15	116.4	15	110.5	30	113.4	15.6
St.Francis Mission	I	80	13	91.0	9	101.4	22	95.3	17.7
Todd County	I	84	15	109.6	14	102.5	29	106.2	17.8
Tlingit (Angoon, Alaska)	II	133	9	84.1	14	93.5	23	89.8	14.9
Mixed Groups									
Chicago, Ill. (Uptown)	I	88	42	101.5	26	115.8	68	107.0	17.8
	II	124	18	99.1	22	102.1	40	100.7	19.2
T.Roosevelt, Ariz. (Apache and Others)	II	136	17	90.8	25	93.3	42	92.3	15.4

Table 3

INDIAN GROUPS WHICH EARNED HIGHEST MEAN IQ SCORES ON THE DRAW-A-MAN TEST; BY SEX AND AGE GROUP

A.

Boys I

Indian Group	Av. Age	N	IQ
Sioux-Cheyenne (Eagle Butte)	82	15	116.4
Hopi	87	25	114.0
Navaho	89	30	110.7
Sioux-Cheyenne (Todd Cty)	82	15	109.6
Eskimo	90	30	108.5
Blackfeet	87	46	107.8

B.

Girls I

Indian Group	Av. Age	N	IQ
Chicago (Uptown)	90	26	115.8
Blackfeet	86	48	115.6
Chippewa	88	21	115.1
Apache (Ft.Thomas)	77	18	111.9
Sioux-Cheyenne (E.Butte)	81	15	110.5
Hopi	87	25	110.4

C.

Boys II

Indian Group	Av. Age	N	IQ
Hopi	145	14	107.1
Papago	134	11	99.2
Chicago	117	18	99.1
Apache (Ft.Thomas)	151	23	98.7
Eskimo	136	31	97.6
Apache (Cibecue)	128	34	97.4

D.

Girls II

Indian Group	Av. Age	N	IQ
Chicago	118	22	102.1
Eskimo	133	31	101.5
Chippewa	118	33	100.0
Menominee	125	75	99.8
Apache (Cibecue)	124	35	98.5
Lumbee (Magnolia)	131	25	95.0

E.

Indian Group	Age Level	N	IQ
Sioux-Cheyenne (Eagle Butte)	I	30	113.4
Pueblo	I	55	112.0
Blackfeet	I	86	111.6
Chippewa	I	40	109.9
Navaho	I	60	109.0
Pima	II	59	92.5
Mixed-T.Roosevelt (Apache)	II	42	92.3
Quinault	II	28	90.0
Thlingit	II	23	89.8
Lumbee (Pembroke)	II	50	89.3

Table 3E--Five Highest and Five Lowest Scoring Indian Groups

The National Study of American Indian Education

Table 4

STATISTICALLY SIGNIFICANT DIFFERENCES ($p<.05$) in $\overline{IQ}$
EARNED BY INDIAN CHILDREN ON THE DRAW-A-MAN TEST

	Boys						Girls					
Indian Group	N	IQ_I	N	IQ_{II}	N	D_{I-II}	Indian Group	N	IQ_I	N	IQ_{II}	N	D_{I-II}
Chippewa	19	104.1	39	89.4	58	14.7	Apache--Ft. Thomas	18	111.9	24	96.2	42	18.1
Lumbee--Pembroke	13	101.6	25	87.9	38	13.7	Hopi	30	110.4	17	93.0	47	17.4
Eskimo	30	108.5	31	97.6	61	10.9	Chippewa	21	115.1	33	94.3	54	15.1
							Papago	13	105.4	21	91.3	34	14.1
							Mixed-Chicago	26	115.8	22	100.7	48	13.7
							Menominee	55	108.0	75	97.6	130	8.2

A. Younger vs. Older Boys

Indian Group	N	IQ_I Girls	N	IQ_I Boys	N	D_{G-B}
Apache-Ft. Thomas	18	111.9	19	97.3	37	14.6
Mixed-Chicago	26	115.8	42	101.5	68	14.3
Chippewa	21	115.1	19	104.1	40	11.0
Lumbee-Magnolia	25	101.5	25	92.4	50	9.1
Menominee	55	108.0	59	99.5	114	8.5
Blackfeet	48	115.6	46	107.8	94	7.8

Younger vs. Older Girls

Indian Group	N	Boys IQ_{II}	N	Girls IQ_{II}	N	D_{B-G}
Hopi	14	107.1	17	93.0	31	14.1
Chippewa	39	89.4	33	100.0	72	10.6

B. Younger Girls vs. Younger Boys

Older Girls vs. Older Boys

Indian Group	N	IQ_I	N	IQ_{II}	N	D_{I-II}
Chippewa	40	109.9	72	94.3	112	15.6
Hopi	55	112.0	31	99.4	86	12.6
Papago	28	104.8	32	94.0	60	10.8
Lumbee-Pembroke	29	98.4	50	89.0	77	9.1
Apache (Ft. Thomas)	37	104.4	47	96.2	80	8.2

C. Younger Children vs. Older Children

Table 5

AVERAGE IQs BY GEOGRAPHICAL AREA

Geographical Area	N	$\overline{IQ}_I$	N	$\overline{IQ}_{II}$	I-II
Midwest: Blackfeet, Chippewa Menominee, Sioux (RedWing and Cheyenne)	401	107.3	277	97.4	9.9
Southwest: Apache, Hopi, Navaho, Papago, Pawnee, Pima, Ponca	237	106.4	262	95.8	10.6
Northwest: Eskimo, Hoopa, Makah, Quinault, Thlingit	152	101.7	190	94.4	7.3
Southeast: Lumbee	77	97.5	100	91.4	6.1

Table 6

TESTING OF ALASKAN PUPILS AT TWO POINTS IN TIME

	1930-31 Testing					1969 Testing			
		Mean IQ DAM			Mean Binet IQ		Mean IQ DAM		
	No.	M.	F.	Total		No.	M.	F.	Total
Eskimo	364	88.7	90.2	89.6	73.7	121	103.0	102.7	102.9
Aleut	90	92.1	94.0	93.3	80.3	—	—	—	
Indian	73	91.9	91.2	91.6	79.0	23	84.1	93.5	89.8

Eskimo Pupils

Age and IQ

Age	No.	DAM IQ	S.B.
8-9	39	98.7	96.0
10	41	91.0	84.3
11	30	97.5	79.2
12	45	89.3	76.0
13	55	86.3	71.4
14	43	86.3	69.4
15	43	84.7	65.1

Age	No.	DAM IQ
6-8.5	59	106.2
8.5-12.5	62	99.6